

CLAIMS

1. A modular fluid valve assembly comprising:
 - a valve, for controlling fluid flow from an inlet port and an outlet port;
 - a control assembly, said control assembly separately connected to said valve to selectively activate said valve;
 - a visual indicator, said visual indicator being electronically connected to said control assembly for indicating the activation of said valve, said visual indicator including a light source for emitting light when said valve is actuated; and
 - a light pipe disposed adjacent to said light source, said light pipe being removably attached to said control assembly, wherein said light pipe facilitates viewing of the activation of said light source.
2. A modular fluid valve assembly as defined in Claim 1, wherein said valve is an electrically operated valve.
3. A modular fluid valve assembly as defined in Claim 2, wherein said control assembly includes a circuit board, said circuit board is electronically connected to said valve to selectively activate said valve.
4. A modular fluid valve assembly as defined in Claim 3, wherein said light source is a light emitting diode (LED).
5. A modular fluid valve assembly as defined in Claim 4, wherein said light pipe includes a stem portion positioned adjacent said LED, said stem portion is connected to an upper display portion, said upper display portion providing a visible area for light from said LED to be viewed.

6. A modular fluid valve assembly as defined in Claim 5, wherein said light pipe is held in place by a light pipe holder positioned adjacent said valve.

7. A modular fluid valve assembly as defined in Claim 6, wherein said light pipe holder further comprises:

a first wall;
an oppositely positioned and substantially parallel second wall;
a third wall, said third wall substantially perpendicular to said first wall, said third wall connecting said first wall and said second wall;
10 a fourth wall, said fourth wall positioned opposite and substantially parallel to said third wall;
a fifth wall positioned substantially parallel and in closer proximity to said third wall than to said fourth wall; and
15 a light pipe receiving aperture, said light pipe receiving aperture comprised of said first wall, second wall, third wall and fifth wall.

8. A modular fluid valve assembly as defined in Claim 7, wherein said light pipe holder further includes a first rib extending outwardly from said third wall and a second rib extending outwardly from said fourth wall.

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9. A modular fluid valve assembly as defined in Claim 8, wherein said fluid valve assembly further includes a manifold, said manifold comprising;
a base;

25 an upstanding wall parametrically bounding and extending from said base, said upstanding wall terminating at and connected to an upper wall, wherein said upper wall is substantially parallel with said base;

a control assembly cavity, said control assembly cavity forming an interior space in said manifold;

at least one valve mounting station, said at least one valve mounting station located on said upper wall; and

5 a first groove in said valve manifold upper surface and a second opposite groove spaced substantially parallel and a distance away from said first groove to create a longitudinally extending slot in said upper wall for accepting said light pipe holder.

10. A modular fluid valve assembly as defined in Claim 9, wherein said control assembly is positioned in said interior space of said manifold.

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11. A modular fluid valve assembly comprising:

a manifold including at least one valve mounting station;
at least one valve, said at least one valve having a mounting base, said mounting base being selectively attachable to said at least one valve mounting station;

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a control assembly, said control assembly electronically connected to said at least one valve to selectively control the activation of said at least one valve;

a light pipe, said light pipe selectively removably attached to said control assembly, wherein said light pipe provides a visual indication of the activation of said at least one valve; and

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a holder, said holder providing a securing location on said manifold for positioning and retaining said light pipe.

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12. A modular fluid valve assembly as defined in Claim 11, wherein said manifold further includes a control assembly cavity, said control assembly cavity providing a location for housing said control assembly.

13. A modular fluid valve assembly as defined in Claim 11, wherein said holder is integrally formed in said manifold.

14. A modular fluid valve assembly as defined in Claim 11, wherein said holder is located adjacent said valve mounting station.

5 15. A modular fluid valve assembly as defined in Claim 11, wherein said light pipe is held in said holder using a selectively removable interference fit.

16. A modular fluid valve assembly as defined in Claim 11, wherein said light pipe is held in said holder using a selectively removable accessible snap fit.

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17. A modular fluid valve assembly as defined in Claim 15, wherein said light pipe is made of a translucent acrylic.

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18. A modular fluid valve assembly as defined in Claim 11, wherein said control assembly comprises a printed circuit board connected to said valves, said printed circuit board including at least one visual indicator for each valve.

19. A modular fluid valve assembly as defined in Claim 18, wherein said visual indicator further includes a light emitting diode (LED).

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20. A modular fluid valve assembly as defined in Claim 19, wherein said light pipe is positioned adjacent said LED to allow light emitted from said LED to travel through said light pipe.

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21. A modular fluid valve assembly as defined in Claim 20, wherein said light pipe includes a stem portion positioned adjacent said LED to allow light emitted from said LED to travel into said light, said stem portion is connected to a upper

display position, said upper display position providing a visible area for light from the LED to be emitted.

22. A visual indicator for use with a valve manifold comprising:
5 a light source for showing activation of a valve;
 a light pipe having a first end positioned adjacent the light source and a second opposite display position;
 a holder adapted to be attached to said manifold; and
 said light pipe being removably held in the holder to permit the light
10 pipe to be removed without the use of tools.

23. A visual indicator as defined in Claim 22, wherein said light pipe is held in said holder using a press fit.

15 24. A visual indicator as defined in Claim 22, wherein said light pipe is held in said holder using an accessible snap fit.

25. A modular fluid valve assembly comprising:
 a manifold having a longitudinal axis and including a first valve
20 mounting station and a second valve mounting station positioned adjacent each other along the longitudinal axis of said manifold, said manifold having a longitudinally extending slot positioned adjacent said valve mounting stations, and a control assembly cavity located in an interior portion of said manifold;
 a first valve being selectively attached to said first valve mounting station;
 a second valve being selectively attached to said second valve mounting station;

a control assembly electronically connected to said first valve and said second valve to selectively activate said valves, said control assembly positioned in said control assembly cavity in said manifold;

5 a first visual indicator electronically connected to said control assembly for indicating the activation said first valve and a second visual indicator electronically connected to said control assembly for indicating the activation of said second valve, said first visual indicator including a first light source for emitting light when said first valve is activated and said second visual indicator including a second light source for emitting light when said second valve is activated;

10 a first light pipe disposed adjacent said first light source and a second light disposed adjacent said second light source for displaying said light emitted from said first light source and said second light source;

15 a first light pipe holder and a second light pipe holder adapted for allowing selectively removable insertion of said first light pipe and said second light pipe, said first light pipe holder and said second light pipe holder is positioned in said slot in said manifold to form an integral portion of said manifold.

26. A modular fluid valve assembly as defined in Claim 25, wherein said first valve and said second valve are electrically operated valves.

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27. A modular fluid valve assembly as defined in Claim 26, wherein said control assembly includes a circuit board, said circuit board is electronically connected to said first valve and said second valve to selectively activate said first valve and said second valve.

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28. A modular fluid valve assembly as defined in Claim 27, wherein said first light source and said second light source are light emitting diodes (LED).

29. A modular fluid valve assembly as defined in Claim 28, wherein said first light pipe and said second light pipe includes a stem portion positioned adjacent said LED, said stem portion is connected to a upper display portion, said upper display portion providing a visible area for light from said LED to be viewed.

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30. A modular fluid valve assembly as defined in Claim 29, wherein said first light pipe holder and said second light pipe holder further comprise:

a first wall;
an oppositely positioned and substantially parallel second wall;
10 a third wall, said third wall substantially perpendicular to said first wall, said third wall connecting said first wall and said second wall;
a fourth wall, said fourth wall positioned opposite and substantially parallel to said third wall;
a fifth wall positioned substantially parallel and in closer proximity to
15 said third wall than to said fourth wall; and
a light pipe receiving aperture, said light pipe receiving aperture comprised of said first wall, second wall, third wall and fifth wall.

31. A modular fluid valve assembly as defined in Claim 30, wherein said first light pipe holder and said second light pipe holder further includes a first rib extending outwardly from said third wall and a second rib extending outwardly from said fourth wall.

25 32. A modular fluid valve assembly as defined in Claim 31, wherein said slot includes a first groove in said manifold upper surface and a second opposite groove spaced substantially parallel a distance away from said first groove to form said slot for accepting said light pipe holder.